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Spectroscopic Results for the Motions of Stars in the Line of Sight, obtained at the Royal Observatory, Greenwich, in the year 1889. *No. XIII.*

(*Communicated by the Astronomer Royal.*)

The results here given are in continuation of those printed in the *Monthly Notices*, vol. xxxvi. p. 318, vol. xxxvii. p. 32, vol. xxxviii. p. 493, vol. xli. p. 109, vol. xlii. p. 230, vol. xliii. p. 81, vol. xliv. p. 89, vol. xlv. p. 330, vol. xlvi. p. 126, vol. xlvii. p. 101, vol. xlviii. p. 116, and vol. xlix. p. 127. The observations were made with the "half-prism" spectroscope, one "half-prism," with a dispersion of about 18½° from A to H, being used throughout. A magnifying power of 14 was employed.

The cylindrical lens has always been used in front of the slit as in the observations made previously to 1881 and since 1882 March 14. The observations of the Sun, Moon, and planets have been made as a check on the general accuracy of the results.

The day specified in the first column is the civil day, and the hour is that of Greenwich civil time, commencing at Greenwich mean midnight, and reckoning from 0 to 24 hours.

The observations were made by Mr. Maunder throughout.

Motions of Stars in the Line of Sight in Miles per Second, observed with the Half-prism Spectroscope

(+ denotes Recession; − Approach.)

Date. 1889.		h	No. of Meas.	Line	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Estimd.	Remarks.
						α Andromedæ.		
Jan.	1	20	2	F	+17·1	−50·4	−59·7	Spectrum bright and steady.
July	31	23	2	F	−14·4	−34·7	−23·1	Definition poor.
Sept.	6	23	2	F	− 7·7	−13·9	−15·0	Spectrum faint. Observed with difficulty.
	16	23	2	F	− 5·2	−22·5	−24·5	Definition poor.
	18	23	2	F	− 4·7	−22·0	−15·8	Star-line seen well.
	25	23	2	F	− 2·8	−11·5	− 9·4	Definition bad.
Oct.	30	21	2	F	+ 7·1	−31·9	−36·0	Definition bad.
Nov.	25	21	2	F	+13·3	−49·0	−46·4	Definition poor.
						β Cassiopeiæ.		
July	31	22	2	F	−11·1	−27·4	−15·6	Definition poor.
Sept.	19	0	2	F	− 6·9	−48·9	−41·8	Star-line seen fairly well, but observing position very awkward.

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Date. 1889.			No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star.		Remarks.
		h				Measd.	Estimd.	
γ Pegasi.								
Sept.	16	23	2	F	− 4·1	−19·1	−22·6	Definition poor.
	18	23	2	F	− 3·5	−36·2	−31·1	Spectrum faint, but steady.
Nov.	25	21	2	F	+15·4	−35·5	−36·9	Spectrum faint and tremulous.
γ Cassiopeiæ.								
July	31	23	2	F	−11·7	+21·3	+19·7	Spectrum faint; definition poor.
Sept.	19	0	2	F	− 8·7	−21·3	−18·2	Spectrum bright and steady.
β Arietis.								
Jan.	1	21	2	F	+17·6	−16·0	−17·6	Star-line very broad and diffused.
Sept.	18	23	2	F	−10·7	−31·4	−13·6	Spectrum bright and steady.
Nov.	25	22	2	F	+ 9·8	+20·1	+19·2	Definition poor.
β Persei.								
Jan.	29	20	2	F	+16·9	−16·5	− 9·0	Spectrum very faint.
Feb.	15	20	4	F	+17·4	−15·5	−14·2	Spectrum faint, but steady.
Sept.	17	0	2	F	−14·6	−33·1	−35·7	Spectrum very faint.
	18	23	4	F	−14·3	+30·5	+33·2	Definition good.
	26	0	4	F	−13·3	−34·0	−29·2	Definition poor.
Nov.	25	21	4	F	+ 2·8	−22·3	−21·4	Definition poor.
α Persei.								
Feb.	15	20	2	F	+16·2	−36·0	−43·3	Spectrum faint, but steady.
Sept.	17	0	2	F	−14·4	+12·6	+ 9·9	Spectrum bright and steady.
	18	23	2	F	−14·2	+ 8·6	+ 8·5	Definition fair.
	26	0	2	F	−13·4	+12·7	+13·4	Definition good.
Nov.	25	20	2	F	+ 0·9	+19·8	+25·6	Spectrum and star-line faint.
Aldebaran.								
Jan.	1	22	1	F	+10·4	+32·7	+35·2	Observation very rough.
Feb.	4	20	2	F	+17·4	− 1·5	+10·2	Star-line seen with difficulty.
	15	21	4	F	+18·4	+30·7	+17·4	Star-line seen very well.
Mar.	5	21	2	b_1	+18·4	+51·1	+46·4	Spectrum *very* tremulous.
Sept.	19	0	2	F	−17·2	+39·6	+39·6	Spectrum rather faint.
Nov.	25	22	2	F	− 1·4	+57·9	+67·6	Spectrum bright and steady.
Dec.	20	21	2	F	+ 6·8	+79·8	+51·2	Observations very rough.

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Date. 1889.			No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star.		Remarks.
		h				Measd.	Estimd.	
						Capella.		
Feb.	15	21	4	F	+16·0	+ 7·8	+ 7·0	Star-line seen fairly well.
Mar.	5	21	2	b_1	+17·1	+ 3·2	+ 3·6	Spectrum *very* tremulous.
Sept.	17	0	2	F	−13·3	+31·3	+38·4	Definition poor.
	19	0	4	F	−16·7	+38·5	+40·4	Spectrum bright and steady.
	26	0	2	F	−16·5	+41·3	+40·8	Definition bad.
Nov.	25	22	2	F	− 4·9	+29·4	+33·9	Spectrum bright and steady.
						Rigel.		
Feb.	4	21	2	F	+14·1	+33·9	+41·0	Star-line seen fairly well.
	8	21	2	F	+14·6	+ 6·2	+11·6	Star-line seen well.
	15	22	2	F	+15·3	− 6·1	− 1·2	Spectrum very tremulous. Star-line seen with great difficulty.
Apr.	5	20	4	F	+13·4	+21·7	+14·7	Spectrum tremulous. Measures rough.
Nov.	25	23	2	F	− 3·5	+31·0	+33·3	Star-line seen well.
Dec.	20	22	2	F	+ 3·9	+33·8	+33·4	Spectrum very unsteady.
						γ Orionis.		
Feb.	4	21	4	F	+15·1	−10·2	− 4·8	Star-line seen fairly well.
	8	21	2	F	+15·8	− 9·6	− 5·1	Spectrum faint.
	15	22	2	F	+16·7	−31·2	−28·1	Star-line seen fairly well.
Nov.	25	23	2	F	− 4·8	−13·5	−17·6	Star-line seen fairly well.
Dec.	20	22	4	F	+ 3·1	+ 9·7	+ 6·8	Star-line seen fairly well.
						β Tauri.		
Feb.	4	21	2	F	+15·5	−14·9	− 2·6	Spectrum faint. Cloudy.
	8	21	2	F	+16·1	−25·7	−23·3	Star-line seen with difficulty.
	15	21	2	F	+17·2	−17·6	−14·0	Star-line seen well.
Sept.	26	0	2	F	−17·8	+16·9	+17·8	Definition fair.
Nov.	25	23	2	F	− 5·9	+40·0	+37·4	Star-line seen fairly well.
Dec.	20	22	2	F	+ 2·7	+29·5	+19·7	Star-line seen fairly well.
						δ Orionis.		
Apr.	5	21	2	F	+15·1	+11·2	+10·2	Spectrum faint. Measures rough.
Nov.	25	23	2	F	− 5·0	+11·0	+10·0	Star-line seen with difficulty.
Dec.	20	23	2	F	+ 2·6	+ 8·7	+ 2·4	Star-line seen fairly well.

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Date. 1889.			No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star.		Remarks.
		h				Measd.	Estimd.	
						ε Orionis.		
Nov.	25	23	2	F	− 5·3	+ 14·4	+ 17·7	Star-line seen fairly well.
Dec.	20	23	2	F	+ 2·2	+ 15·0	+ 12·7	Star-line seen fairly well.
						ζ Orionis.		
Nov.	26	0	4	F	− 5·6	+ 3·2	+ 5·6	Star-line seen fairly well.
Dec.	20	23	2	F	+ 1·9	+ 27·1	+ 13·0	Star-line seen fairly well.
						α Orionis.		
Mar.	5	22	4	b_4	+ 17·5	+ 2·6	+ 9·1	Star-line seen with great difficulty. Measures rough.
						β Aurigæ.		
Feb.	15	21	2	F	+ 15·0	− 3·5	+ 1·2	Spectrum bright and steady
Sept.	26	0	4	F	− 17·0	− 0·6	+ 6·4	Definition poor.
Nov.	25	22	2	F	− 7·3	+ 31·9	+ 27·2	Spectrum fairly bright, but star-line faint.
						γ Geminorum.		
Feb.	15	23	4	F	+ 14·3	− 75·0	− 63·1	Spectrum faint but steady.
Dec.	20	23	2	F	− 2·7	− 50·5	− 33·7	Star-line seen very well.
						Sirius.		
Feb.	8	22	6	F	+ 8·9	− 13·2	− 13·1	Measures made with difficulty.
	15	22	6	F	+ 10·2	− 31·7	− 28·4	Spectrum very unsteady.
Mar.	27	21	4	F	+ 14·1	− 43·7	− 49·5	Spectrum very unsteady.
Apr.	15	20	4	F	+ 13·7	− 44·0	− 45·5	Spectrum faint, and very unsteady. Measures very rough.
Nov.	26	0	6	F	− 9·1	+ 3·8	+ 7·5	Spectrum very unsteady.
Dec.	21	0	4	F	− 3·3	− 51·8	− 38·1	Spectrum very unsteady.
						Castor.		
Feb.	15	23	2	F	+ 11·6	+ 34·7	+ 23·1	Definition good.
Mar.	27	22	2	F	+ 17·8	− 37·1	− 43·2	Spectrum and star-line faint.
Apr.	25	22	2	F	+ 17·0	− 13·4	− 7·0	Spectrum faint.
Dec.	21	0	2	F	− 6·2	+ 33·5	+ 23·6	Star-line seen well.
						Procyon.		
Feb.	8	22	2	F	+ 8·0	− 9·5	− 11·6	Star-line faint.
	15	23	4	F	+ 9·9	− 7·9	− 5·8	Star-line faint.
Mar.	27	22	2	F	+ 16·9	− 6·7	− 8·9	Spectrum fairly steady.
Apr.	15	21	1	F	+ 17·5	− 43·0	− 51·0	Observations interrupted by cloud.
Dec.	21	0	4	F	− 7·7	+ 6·7	+ 7·7	Star-line seen fairly well.

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Date. 1889.	h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
				Pollux.			
Feb. 8	23	2	F	+ 9·0	−13·0	−16·1	Star-line seen with difficulty.
15	23	2	F	+10·9	−52·7	−43·5	Star-line faint.
Mar. 5	22	2	b_1	+15·0	−43·2	−49·4	Spectrum very unsteady, but star-line sharp.
27	22	2	F	+17·7	−53·4	−60·5	Star-line seen fairly well.
Dec. 21	0	2	F	− 7·2	−12·6	− 7·7	Star-line very faint.
				Regulus.			
Feb. 15	23	2	F	− 0·3	+25·2	+19·3	Spectrum seen well.
Mar. 27	22	2	F	+11·6	+13·3	+11·8	Observations made with difficulty.
Apr. 25	22	4	F	+16·7	+20·4	+20·7	Star-line seen well.
30	22	2	F	+17·2	−24·2	−22·1	Spectrum bright but tremulous. Star-line faint, and seen with difficulty.
May 2	23	2	F	+17·4	+16·3	+20·7	Spectrum bright and fairly steady.
				γ Leonis.			
Mar. 5	23	2	b_1	+ 5·5	−30·7	−39·9	Spectrum bright but very tremulous.
27	23	2	F	+11·5	−18·2	−25·5	Star-line seen with great difficulty. Measures rough.
Apr. 30	22	2	F	+17·0	+14·7	+17·8	Spectrum bright and fairly steady. Star-line faint.
				β Ursæ Majoris.			
May 2	22	4	F	+12·7	−25·1	−26·7	Spectrum bright and steady. Star-line seen well.
				α Ursæ Majoris.			
May 2	21	4	F	+11·7	−29·3	−27·8	Spectrum bright and steady. Star-line seen well.
				δ Leonis.			
May 3	23	2	F	+15·5	−63·1	−52·8	Spectrum rather faint.
				β Leonis.			
Mar. 27	23	2	F	+ 5·4	+ 8·4	+16·0	Spectrum bright and fairly steady. Star-line very broad, diffused, and difficult to bisect.
Apr. 30	22	4	F	+13·6	−25·0	−21·9	
May 2	23	4	F	+14·0	−71·1	−69·1	
				γ Ursæ Majoris.			
May 2	22	4	F	+11·8	+ 4·2	+ 4·3	Spectrum bright and steady.

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Date. 1889.			No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star.		Remarks.
		h				Measd.	Estimd.	
						δ Ursæ Majoris.		
May	2	22	4	F	+10·7	−15·5	−15·7	Spectrum bright and steady; star-line seen well.
						γ Virginis.		
Mar.	27	23	2	F	−0·4	+22·6	+30·5	Measures rough and made with difficulty.
May	2	23	2	F	+10·1	−41·5	−38·0	Spectrum and star-line faint.
						ε Ursæ Majoris.		
May	2	23	4	F	+9·5	−7·4	−9·5	Spectrum bright and steady.
						α Canum Venaticorum.		
Mar.	27	23	2	F	+3·5	−55·1	−54·3	Spectrum faint but steady.
						Spica.		
Mar.	27	23	2	F	−4·7	+31·2	+32·8	Spectrum bright but very tremulous.
Apr.	15	23	2	F	+1·2	+46·0	+35·6	Spectrum bright but tremulous.
	30	23	4	F	+5·7	−9·8	−10·5	Star-line faint.
May	2	23	2	F	+6·3	−8·7	−6·3	Spectrum very tremulous.
						ζ Ursæ Majoris.		
Mar.	28	0	4	F	+4·0	−22·7	−32·4	Spectrum bright and steady; observing-position very awkward and measures rough.
May	3	0	4	F	+8·5	−6·7	−8·5	Spectrum bright and steady.
						η Ursæ Majoris.		
Mar.	28	0	2	F	+2·3	−62·6	−69·1	Spectrum bright and steady; observing-position very awkward and measures rough.
May	3	0	4	F	+7·7	−19·0	−23·8	Spectrum bright and steady.
						η Boötis.		
Mar.	5	23	2	b_1	−8·8	+44·0	+44·2	Star-line seen with difficulty. Measures rough.
						Arcturus.		
Mar.	6	0	2	*b*	−9·7	−49·3	−49·2	Spectrum bright but tremulous. Measures very accordant.
	22	0	2	F	−5·5	−29·0	−20·9	Spectrum faint and tremulous.
	28	0	2	F	−4·1	−31·9	−40·1	Spectrum bright but tremulous.

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Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	15	22	2	F	+ 0·9	−24·7	−31·0	Spectrum bright but tremulous.
	30	23	2	F	+ 4·8	−25·1	−38·0	Star-line faint.
May	3	0	2	F	+ 5·3	−45·9	−47·4	Spectrum very bright but tremulous.
June	27	0	2	F	+14·6	−67·2	−61·5	Spectrum bright but *very* tremulous.

γ Boötis.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	30	23	2	F	+ 4·9	−69·1	−63·0	Spectrum rather faint, but steady.

ε Boötis.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Mar.	6	0	2	b_1	− 9·3	−13·8	−39·2	Star-line seen with difficulty. Measures rough.

β Libræ.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	30	23	2	F	− 2·2	−27·4	−26·8	Spectrum fairly bright, but tremulous.

α Coronæ Borealis.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Mar.	22	1	2	F	− 8·2	+ 8·8	+ 8·2	Definition poor. Measures rough.
Apr.	30	23	2	F	0·0	+27·6	+21·5	Spectrum bright, and fairly steady.
June	27	0	4	F	+10·4	−13·1	− 6·9	Spectrum very tremulous. Measures very rough.
July	15	23	4	F	+12·2	+24·9	+29·2	Spectrum bright, but tremulous.

β Serpentis.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	30	23	2	F	− 2·0	−40·6	−39·5	Spectrum faint, but fairly steady.

α Ophiuchi.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	30	23	2	F	− 9·4	+56·1	+59·2	Spectrum bright, and fairly steady.
June	27	0	2	F	+ 3·6	−33·3	−38·8	Definition poor.
July	15	23	2	F	+ 7·8	−36·1	−30·0	Spectrum bright, but tremulous.
	19	23	4	F	+ 8·6	−34·8	−36·4	Spectrum fairly bright and steady.

Vega.

Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Apr.	30	23	4	F	− 7·6	−22·6	−20·6	Spectrum very bright and steady.
June	27	1	2	F	− 1·2	− 3·3	− 8·2	Spectrum very tremulous.
July	16	0	4	F	+ 1·4	−22·0	−24·6	Definition poor.
	19	23	4	F	+ 2·0	−22·4	−27·0	Spectrum very bright.
Sept.	6	21	2	F	+ 7·5	−59·7	−54·4	Definition fair.
	13	21	2	F	+ 8·0	−47·0	−41·9	Definition poor.
	16	20	2	F	+ 0·8	−35·0	−38·9	Star-line seen well.
	18	21	2	F	+ 8·2	−56·2	−49·8	Definition fair.

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Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Estimd.	Remarks.
γ Lyræ.								
Sept.	18	21	2	F	+ 9·5	−82·1	−63·9	Spectrum very faint. Measures rough, and made with great difficulty.
ζ Aquilæ.								
July	15	23	4	F	+ 1·3	−22·6	−23·6	Star-line seen fairly well.
	19	23	2	F	+ 2·3	−48·2	−46·8	Spectrum faint. Star-line difficult to bisect.
Sept.	18	21	2	F	+13·6	−25·6	−27·1	Spectrum very faint. Measures rough, and made with great difficulty.
δ Aquilæ.								
July	19	23	2	F	+ 1·5	−34·3	−29·3	Spectrum very faint. Measures rough.
δ Cygni.								
Sept.	18	21	2	F	+ 5·2	+ 9·4	+ 7·6	Spectrum very faint. Measures rough.
Altair.								
June	27	0	2	F	− 6·5	−44·8	−40·4	Observations interrupted by cloud.
July	16	0	4	F	− 1·8	−26·0	−24·0	Definition poor.
	20	0	2	F	− 0·8	−50·0	−49·3	Spectrum bright and steady.
Sept.	6	22	2	F	+11·0	−41·0	−40·8	Definition fair.
	13	21	2	F	+12·3	−34·0	−35·5	Definition poor.
	16	21	4	F	+12·8	−34·6	−39·9	Star-line seen fairly well.
	18	22	4	F	+13·2	−37·1	−39·1	Definition fair.
	25	22	2	F	+14·2	−39·1	−41·0	Spectrum faint and tremulous.
α Cygni.								
June	27	1	2	F	− 7·6	−43·6	−34·6	Definition good.
July	16	0	2	F	− 5·8	−51·5	−49·8	Star-line seen fairly well.
	20	0	2	F	− 5·3	−39·0	−41·1	Observing-position very awkward.
	31	22	2	F	− 3·8	−50·6	−27·4	Definition poor.
Sept.	6	23	2	F	+ 1·7	−27·6	−35·8	Star-line faint and seen with difficulty.
	13	22	2	F	+ 2·7	−26·2	−32·8	Star-line faint and seen with difficulty.
	16	21	2	F	+ 3·2	−64·1	−61·1	Observing-position awkward.
	18	22	2	F	+ 3·5	−32·4	−32·3	Definition fair.
	25	23	2	F	+ 4·5	−59·5	−50·1	Definition good.
α Cephei.								
July	20	0	2	F	− 6·2	−78·4	−67·9	Observing-position very awkward.
	31	22	2	F	− 5·7	−44·9	−23·3	Definition poor.

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Date. 1889.		h	No. of Meas.	Line.	Earth's Motion in miles per sec.	Concluded Motion of Star. Measd.	Concluded Motion of Star. Estimd.	Remarks.
Sept.	16	22	2	F	− 1·9	−30·9	−34·7	Observing-position very awkward. Measures rough.
	25	23	2	F	− 0·9	−53·6	−42·9	Star-line seen with great difficulty. Measures rough.
α Pegasi.								
Sept.	13	22	1	F	− 0·2	−56·3	−46·1	Observations interrupted by cloud.
	16	22	2	F	+ 0·7	−30·9	−31·2	Star-line seen fairly well.
	18	22	2	F	+ 1·3	−53·0	−50·0	Spectrum faint. Measures rough and made with difficulty.
Venus.								
Feb.	4	19	2	F	...	+20·1	+18·1	Calculated motion −7·8 miles per second.
	15	21	2	F	...	−14·9	−11·4	Calculated motion −8·0 miles per second.
Moon.								
Feb.	4	20	5	F	...	− 2·0	...	The coincidence of the two spectra appeared perfect.
	15	23	5	F	...	+ 2·7	...	Measures made with pointer.
	16	0	5	F	...	+ 2·8	...	Measures made with spider-line.
Apr.	5	21	5	F	...	+ 3·0	...	
	15	21	8	F	..	− 1·5	...	
July	16	0	5	F	...	+ 0·3	...	
Sept.	6	22	5	F	...	− 1·6	...	
	17	1	5	F	...	+ 1·6	...	
Dec.	3	21	5	F	...	+ 2·3	...	
Sun.								
May	3	12	5	F	...	− 1·6	...	The coincidence of the two spectra appeared perfect.
Sky.								
Feb.	9	12	5	F	...	+ 1·5	...	The coincidence of the two spectra appeared perfect.
Mar.	28	12	5	F	...	+ 1·3	...	
Aug.	1	11	5	F	...	+ 1·4	...	
Sept.	26	12	5	F	...	− 0·1	...	

Ring of Saturn.

Relative displacement of the preceding and following ansæ of Ring B immediately within the Cassinian division.

		h			*p*−*f* ansa.	
Mar.	5	22	5	b_1	+37·0	Spectrum very faint; lines seen with great difficulty. Observations rough. Computed relative motion, +19·4 miles per second.

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Observations of Occultations of Stars by the Moon and of Phenomena of Jupiter's Satellites, made at the Royal Observatory, Greenwich, in the year 1889.

(*Communicated by the Astronomer Royal.*)

Occultations of Stars by the Moon.

Day.		Phenomenon.	Telescope.	Power.	Moon's Limb.	Mean Solar Time of Observation. h m s	Observer.
1889, Feb.	9	Disapp. *i* Tauri	Altaz.	100	Dark	6 46 18·15	A. D.
	12	„ 63 Geminorum	Altaz.	100	„	7 40 47·33	H. T.
	12	„ 63 Geminorum	E. Equat.	140	„	7 40 47·49	H.
Sept.	16 (*a*)	„ ζ Tauri	Lassell Refl.	280	Bright	12 53 41·49	H. T.
	16 (*b*)	„ ζ Tauri	Altaz.	100	„	12 53 41·15	L.
	16	Reapp. ζ Tauri	Lassell Refl.	280	Dark	13 36 55·29	H. T.
	16	„ ζ Tauri	Altaz.	100	„	13 36 55·96	L.
Oct.	5	Disapp. 56 Aquarii	Altaz.	100	„	8 39 47·40	T.
	29	„ Piazzi xix. 22	Altaz.	100	„	6 30 57·95	W. R.
Dec.	31	„ 85 Ceti	E. Equat.	200	„	5 4 58·36	C.
	31	„ 85 Ceti	Altaz.	100	„	5 4 57·86	H.

Notes.

(*a*) No projection. Disappeared instantaneously at bright limb.

(*b*) Star touched the Moon's limb 5 seconds before time of observation, was wholly inside the limb at 12^h 53^m 40^s; it appeared as a brilliant spot on the Moon, and disappeared suddenly at time given above.

For the occultation of *Jupiter* on August 7 and of Satellites II. and IV., see vol. l. p. 36.